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ABSTRACT

The efforts of smoking cessation programs have met with various degrees of success and fresh approaches to the problem are needed. An innovative technique that interrupts the psychogenic drives of smokers was employed to determine the effect of noxious subliminal suggestion on smoking attitudes and behavior. Adult smokers (N=60) were shown anti-smoking films. The experimental group's film contained six splices of noxious subliminal stimuli (a cigarette package with a skull and crossbones and the word "POISON"). Contrary to expectation, subliminal suggestion was not effective in modifying either smokers' attitudes or behaviors. No relationship was found between smoker attitudes and the initial age for the onset of smoking behaviors or the number of cigarettes consumed. The results appear to contradict previous research about the effectiveness of subliminal suggestion. (JAC)

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THE EFFECTS OF NOXIOUS SUBLIMINAL SUGGESTION UPON SMOKING ATTITUDES AND BEHAVIOR

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PURPOSE: The purpose of this study was to determine the feasibility of using subliminal suggestion to develop positive attitudes and deter smoking behavior with particular emphasis on assessing the utility of this behavior modification technique with hardcore smokers.

SIGNIFICANCE: An extraordinarily large number of approaches exist which are designed to prevent cigarette smoking and/or discourage smokers from continuing this practice. None are totally successful. New methods are continually be sought to increase success potential. This study addresses itself to the feasibility of employing subliminal suggestion in reducing and/or preventing smoking behavior. Subliminal suggestion has been used with partial success in combating some health problems.

PROCEDURES: Fifty-three adult subjects, all of them smokers, volunteered to participate. Participants were randomly assigned to either the experimental or control group. Phase I of the study required both the experimental and control groups to respond to a two-part questionnaire. Part I asked respondents to identify their pattern of smoking and other demographic and sociological data. Part II consisted of a twenty-item smokers' attitude inventory which has a reliability coefficient of 0.84. Phase II of the study subjected all participants to the viewing of a 4½ minute film for three consecutive days. The only difference was that the experimental group saw a film that included six noxious subliminal messages inserted in various fade-out points. Upon viewing the film for the third and last time, participants were then asked to again respond to both parts of the questionnaire. Correlation coefficients and t-tests were computed on various aspects of the data.

FINDINGS:

1. Contrary to the findings of Hart and Silverman, subliminal suggestion was not found to be effective in modifying either attitudes or behavior of cigarette smokers.
2. No relationship was found between smoker attitudes and a) the age at which they began smoking, b) the length of time spent as a smoker, or c) the number of cigarettes consumed.

CONCLUSIONS: Negative results may be attributed to the immediacy of data collection which may not have permitted the subliminal suggestion to take effect. Further, the experimental procedure may best be incorporated as one phase of existing preventive programs, since smoking is a complex behavior.

INTRODUCTION

Despite numerous warnings that cigarette smoking is detrimental to one's health and life, consumption of cigarettes by the American public continues to increase. (1) The fact that Americans smoked 15 billion more cigarettes in 1976 than they did in 1975 is indicative of this trend. The most recent Surgeon General's Report on Smoking and Health, issued in January 1979, attests to the dangers of cigarette smoking, high consumption of cigarettes among Americans, and the need for ways and means to alleviate this problem. (2) Heightening the dilemma is the fact that many of these smokers wish to stop smoking, but feel that they can not. It is evident that other motivations override the desire to stop.

An important factor preventing many smokers from ending the cigarette habit is that their dependence develops over a long period of time. This dependence involves both psychological and pharmacological factors, and obviously is severe enough to more than counteract the known facts concerning smoking and health. While anti-smoking information and education programs may be of value to individuals who do not yet smoke, other alternatives must be devised to help those who are beyond this point.

The Surgeon General's Advisory Committee on Smoking and Health has recommended that, "discontinuation of smoking is accomplished best by reinforcing factors which interrupt the psychogenic drives. (3)" Operating along this guideline, the cumulative efforts of a number of smoking cessation programs

have met with only varying success.(4) As it is evident that their success has merely managed to slow the growth of cigarette consumption rather than reverse it, the need to find fresh approaches to smoking cessation becomes of paramount importance.

Purpose of the Study

The purpose of this investigation was to identify and employ an innovative technique that interrupts the psychogenic drives of smokers and to determine its effect upon smoking behavior. Subliminal suggestion has met with modest success as a behavior modification device. Several research investigations support the notion that subliminal suggestion could be successfully used in behavior modification programs to alter unhealthy behavior. Hart, for example, demonstrated that subliminal suggestion was effective in reducing alcohol consumption among a group of alcoholics. (5). George and Jennings were able to demonstrate that subliminal suggestion could be used to constructively modify food consumption patterns of obese individuals for extended periods of time.(6). This finding corroborated similar conclusions demonstrated by Spence.(7).

It is also of interest that subliminal suggestion has been successfully employed in altering speech patterns. Silverman and his colleagues were able to effectively increase and decrease the rate and severity of stuttering among a group of stutterers by exposing them to various noxious and supportive subliminal messages, respectively.(8). These findings warranted an investigation of the role that subliminal suggestion could play in reducing cigarette consumption patterns.

This study tested the null hypothesis that there is no significant difference for the experimental group between the mean scores of the subjects on the pre-test and the post-test with respect to mean smoking attitudes.

The specific questions investigated in this study were:

1. What is the success potential of noxious subliminal suggestion in modifying smoker attitudes toward cigarette smoking?
2. What is the effect of subliminal suggestion in relation to various behavioral characteristics:
   a. length of time as a smoker;
   b. amount of consumption;
   c. age at which a person began smoking?
3. What is the success potential of noxious subliminal suggestion in modifying tobacco consumption habits of smokers?

Delimitations

Ideally, the incorporation of noxious subliminal suggestions to influence tobacco consumption attitudes and practices may be viewed as one phase of an overall anti-smoking education program. While a variety of nationally known and highly regarded anti-smoking education programs demonstrated genuine interest in the project, none would consent to incorporating a subliminal suggesting phase into the fabric of their existing program. Ethical considerations were always given as the reason not to participate. The only alternative was to restrict the study to an examination of the isolated effect of noxious subliminal suggestions on smoking behavior. It must also be realized that this investigation isolated a psychological device to influence

smoking attitudes and behavior. This is an artificial means of influencing a complex behavior. Perhaps the subliminal suggestion should be incorporated into an anti-smoking education program. It would thus serve as part of an organized concerted effort to stop this behavior.

Methodology

Selection of the Subjects

A sample of 60 smokers above the age of 18 were recruited via an advertising flier to participate in this experimental study. As a pre-recruitment condition, the volunteers were told that, "The program involves an educational approach that is designed to help problem smokers quit the smoking habit." The method that would be used, a film with noxious subliminal suggestions, to effect behavior change, was not revealed. Recruiting people who were interested in smoking cessation and motivated enough to participate in the experiment may have biased the results in favor of the study. It must also be noted that actual consumption patterns of participants were not directly observed. This information was secured from the respondents.

Beginning with the number "1" and numbering consecutively to 60, each subject was assigned a number in the order that he/she volunteered to take part in the study. When recruitment had been completed, a table of random numbers was used to randomly assign volunteers to either the experimental or control group.

On the first day of the program, all thirty of the subjects within the experimental group appeared as scheduled for the administration of the pre-program questionnaire, and the ensuing first showing of the experimental film. Only 23 subjects in the control group appeared. The seven missing subjects from the control group were eliminated from the experiment. Attrition for each group over the three day experimental period was relatively low. Ninety percent of the subjects in the experimental group and ninety-one percent of the subjects in the control group completed the study.

Evaluative Materials

The technical equipment used in the study included the noxious subliminal message and two identical anti-smoking films. The control device consisted of the 4½ minute anti-smoking film, "The Time to Stop is Now." The subliminal device was created by taking an identical copy of the control film and splicing into it at 6 fade out-fade in points the noxious subliminal stimuli. This stimulus consisted of a black and white frame depicting a cigarette package with a skull and cross bones, and bearing the word POISON in white capital letters.

The two groups viewed the films under identical conditions and procedures. The projection mechanics (focal length, height) were the same for both groups and remained constant throughout the study. In a pilot study, an acceptable audio level was determined and the volume control was taped fast at that point to ensure consistency in the audio portion of the presentation.

The self-reporting evaluation instrument used in this study was identical for both the experimental and control groups. It consisted of two parts. Part I sought to identify demographic characteristics of the sample as well as their smoking behavior patterns. Participants were asked to identify their age, sex, educational level, as well as their marital and socioeconomic status. A second section of Part I sought to determine when each subject began smoking, the length of time he/she has been smoking and his/her average daily consumption.

Part II of the inventory assessed the subject's attitudes toward smoking. To achieve this, the smoking subscale of the Simpson Drug Attitude Inventory was used.(9). This Likert type instrument has a reliability coefficient of .84 and rated respondent's attitudes on a five point scale from strongly agree to strongly disagree. Items were assigned values so that five points were given for responses that a panel of experts considered to be an ideal response representing a positive health viewpoint. The least positive attitude received a score of one with neutral responses given a value of three. Thus, the higher the score, the more anti-smoking the attitude. The highest score a person could receive on the inventory was 100 (5 x 20) and the lowest score was 20 (1 x 20). The score value of 60, the average of the highest and lowest possible scores, were used to separate high scores from low scores when correlational analysis was performed with respect to demographic variables and tobacco consumption patterns.

Experimental Procedures

The pre-program questionnaire was administered to each group in an identical manner. The participants were requested to answer the questionnaire without discussing their answers with the other subjects. When all subjects had finished, the questionnaires were collected. The first showing of the respective film presentations was viewed by each group immediately thereafter. The groups each viewed their film a total of three times on three consecutive days. Following the third showing, each group was administered the post-program questionnaires under controlled conditions.

Analysis of the Data

Using the pre and post attitude inventory test results, the experimental group and the control group were divided to form four subgroups: the pre and post-control groups and the pre and post-experimental groups. Table 1 identifies mean attitude scores of these groups.

TABLE 1

MEAN ATTITUDE SCORES OF SPECIFIED GROUPS

Group	Score
Pre-control	77.1739
Pre-experimental	81.9333
Post-control	79.0476
Post-experimental	81.9259

Mean attitude scores were subjected to t-tests to determine if there was a significant difference between the mean attitide scores between groups. These comparisons are shown in Table 2. A t-value of 2.01 was necessary for significance at the .05 level.

TABLE 2

T-VALUES OF GROUP COMPARISONS

Groups Compared	T-Value
Pre-control/Post-control	0.69
Pre-/experimental/Post-experimental	0.00
Pre-control/Pre-experimental	1.89
Post-control/Post-experimental	1.11

For the purposes of further investigation, Pearson Product Moment Correlation Coefficients, for both the post-control and the post-experimental groups, were calculated to determine the nature of the relationship between the mean attitude scores of smokers with respect to the following demographic variables:

1. the age at which one began smoking;
2. the length of time as a smoker;
3. the level of cigarette consumption.

A t-value of 2.08 is necessary for significance at the.05 level. Table 3 summarizes this data.

TABLE 3

POST-CONTROL AND POST-EXPERIMENTAL GROUP PEARSON CORRELATION COEFFICIENTS FOR THE RELATIONSHIP BETWEEN SMOKING ATTITUDE SCORES AND SMOKING BEHAVIOR CHARACTERISTICS

	Post-Control		Post-Experimental	
Behavior Characteristics	Correlation Coefficient	T-Value	Correlation Coefficient	T-Value
Age person began smoking	0.1525	0.26	0.0574	0.39
Length of time as a smoker	0.0717	0.38	0.0409	0.42
Level of cigarette consumption	0.3150	0.08	0.4107	0.02

Hypothesis Testing

The null hypothesis states that for the experimental group, there is no significant difference between the mean scores of the subjects on the pre-test and the post-test with respect to

mean smoking attitudes. Therefore, the null hypothesis is not rejected. There is no significant difference between the mean attitude scores of subjects in the post-control and post-experimental groups with respect to smoking.

Discussion

Contrary to the findings of Hart (5) and Silverman et al (8) who successfully demonstrated the use of subliminal suggestion in modifying behavior, thefindings of this study indicate that subliminal suggestion was ineffective in modifying attitudes towards cigarette smoking. Further, no relationship was found to exist between smoker attitudes and any of the smoker characteristics examined including the age at which smoking was initiated, length of time spent as a smoker and number of cigarettes consumed. The effectiveness of subliminal suggestion has been demonstrated in other studies. Therefore, consideration is given to the issue of why subliminal suggestion failed to significantly modify the mean attitude scores in this study. Our major concern is that the administration of the post-program questionnaire immediately after the last film showing may not have allowed enough time for the attitudes towards cigarette smoking to make significant shifts. A re-examination of the attitudes of the subjects at a later date may have shown that attitudes had significantly shifted. Since participant anonymity was maintained, follow-ups on these subjects are not feasible at this time. Our suggestion is that the study be replicated securing data for analysis at intervals of 1,3,6 and 12 months after exposure to the subliminal devices.

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